

CLAIMS

1. An image interpolation system for interpolating the gaps between the lines forming an image, comprising:

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5 a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

an interpolating means for interpolating the pixels between input image lines, based on the generated virtual
10 interpolation data.

2. An image interpolation system for interpolating the gaps between the lines forming an image, comprising:

a virtual interpolation data generating means for
15 generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

an interpolating means which, based on the generated virtual interpolation data, generates pre-interpolation
20 pixels on the input image lines, and interpolates the pixels between input image lines above and below by performing mutual operations between pre-interpolation pixels generated on the input image lines above and below.

25 3. An image interpolation system for interpolating the gaps

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setup means.

5. The image interpolation system according to Claim 3,
wherein the interpolation segment determining means
5 comprises: a search condition setup means for setting up a
pattern search range; a matching pattern condition setup means
for setting up matching pattern conditions; a first matching
pattern searching means for searching matching patterns based
on the conditions designated by the search condition setup
10 means and by the matching pattern condition setup means; a
directional vector extracting means for extracting the
direction of the vector of the detected matching patterns;
and a second matching pattern searching means for searching
for matching patterns existing in the extracted direction
15 of the vector, based on the conditions designated by the search
condition setup means and by the matching pattern condition
setup means.

6. The image interpolation system according to Claim 1,
20 wherein the virtual interpolation data generated by the
virtual interpolation data generating means is constructed
of units of pixel-rows of data.

7. The image interpolation system according to Claim 2,
25 wherein the virtual interpolation data generated by the

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virtual interpolation data generating means is constructed of units of pixel-rows of data.

8. The image interpolation system according to Claim 3,
5 wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

9. The image interpolation system according to Claim 4,
10 wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

10. The image interpolation system according to Claim 5,
15 wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

11. The image interpolation system according to Claim 1,
20 wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to
25 the calculated value of the difference in pixel data; and

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a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

12. The image interpolation system according to Claim 2,
5 wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to
10 the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

13. The image interpolation system according to Claim 3,
15 wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to
20 the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

14. The image interpolation system according to Claim 4,
25 wherein the virtual interpolation data generating means

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comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

15. The image interpolation system according to Claim 5, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

16. The image interpolation system according to Claims 6 through 10, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and

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a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

17. The image interpolation system according to Claim 1,
5 wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to
10 the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and
15 editing them.

18. The image interpolation system according to Claim 2,
wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating
20 the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized
25 and classified in an identical class as patterns; and a coring

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means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

5 19. The image interpolation system according to Claim 3,
wherein the virtual interpolation data generating means
comprises: an inter-pixel operating means for calculating
the difference in pixel data between the pixels on the
neighboring input image lines; a normalizing means for
10 classifying the pixels into multiple classes according to
the calculated value of the difference in pixel data; a pattern
extracting means for extracting rows of pixels normalized
and classified in an identical class as patterns; and a coring
means for judging the patterns extracted on the same line
15 to be interpolated based on the predetermined threshold and
editing them.

20. The image interpolation system according to Claim 4,
wherein the virtual interpolation data generating means
20 comprises: an inter-pixel operating means for calculating
the difference in pixel data between the pixels on the
neighboring input image lines; a normalizing means for
classifying the pixels into multiple classes according to
the calculated value of the difference in pixel data; a pattern
25 extracting means for extracting rows of pixels normalized

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and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

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21. The image interpolation system according to Claim 5, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the
10 neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring
15 means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

22. The image interpolation system according to Claim 16,
20 wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to
25 the calculated value of the difference in pixel data; a pattern

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extracting means for extracting rows of pixels normalized
and classified in an identical class as patterns; and a coring
means for judging the patterns extracted on the same line
to be interpolated based on the predetermined threshold and
5 editing them.

23. The image interpolation system according to Claim 17,
wherein the coring means comprises: an intra-pattern pixel
operating means for calculating the average of the pixel
10 differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
based on the predetermined threshold and editing patterns.

24. The image interpolation system according to Claim 18,
15 wherein the coring means comprises: an intra-pattern pixel
operating means for calculating the average of the pixel
differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
based on the predetermined threshold and editing patterns.

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25. The image interpolation system according to Claim 19,
wherein the coring means comprises: an intra-pattern pixel
operating means for calculating the average of the pixel
differential values of individual pixels in each pattern;
25 and a pattern editing means for judging the average value

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based on the predetermined threshold and editing patterns.

26. The image interpolation system according to Claim 20,
wherein the coring means comprises: an intra-pattern pixel
5 operating means for calculating the average of the pixel
differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
based on the predetermined threshold and editing patterns.

10 27. The image interpolation system according to Claim 21,
wherein the coring means comprises: an intra-pattern pixel
operating means for calculating the average of the pixel
differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
15 based on the predetermined threshold and editing patterns.

28. The image interpolation system according to Claim 22,
wherein the coring means comprises: an intra-pattern pixel
operating means for calculating the average of the pixel
20 differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
based on the predetermined threshold and editing patterns.

29. An image interpolation method for interpolating the gaps
25 between the lines forming an image, comprising:

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a step of generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

a step of interpolating the pixels between input image
5 lines, based on the generated virtual interpolation data.

30. An image interpolation method for interpolating the gaps between the lines forming an image, comprising:

a step of generating virtual interpolation data of
10 inter-lines between the lines of the input image, based on the input image line data; and

a step of generating pre-interpolation pixels on the input image lines based on the generated virtual interpolation data and interpolating the pixels between input image lines
15 above and below by performing mutual operations between pre-interpolation pixels generated on the input image lines above and below.

31. An image interpolation method for interpolating the gaps
20 between the lines forming an image, comprising:

a step of generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data;

a step of determining segments to be interpolated between
25 the input image lines and/or the direction of interpolation,

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based on the generated virtual interpolation data; and

a step of generating pre-interpolation pixels on the
input image lines, based on the generated virtual
interpolation data and the determined data of the segments
5 to be interpolated, and interpolating the pixels between input
image lines based on the generated pre-interpolation pixels.

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